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# HEALTH CARE IN SEAFARING

– Literature review



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## HEALTH CARE IN SEAFARING

- Literature review

The Baltic Sea is globally one of the busiest sea areas and the amount of the operating vessels is growing. Therefore health care professionals are increasingly needed in seafaring. This thesis is produced for an EU project called OnBoard-Med. The project requested a research from the current amount of information on ship nursing. This thesis aims to provide general information about health care in seafaring. This thesis was produced as a literature review. A systematic research was done from four databases: Cinahl, Ovid, PubMed and Merilääketieteen tietokanta. After discovering a limited amount of information from databases the research continued manually from other sources. The thesis ended up being a combination of critical review and mapping review.

Main topics were chosen based on the reliable information found around ship nursing. Ship nurse and occupational health care were themes that stood out the most. In addition, ship pharmacy was chosen as a third topic because of its relevancy to offshore health care.

Clear conclusion is that there is not enough valid information available. Most of the found information is irrelevant or outdated. Reliable and broader researches should be done in order to present valid and modern information. The research requested by OnBoard-Med was successfully done and the results are given to OnBoard-Med for their use.

### KEYWORDS:

Ship nurse, seafaring, offshore, occupational health care, ship pharmacy.

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## TERVEYDENHUOLTO MERELLÄ

### - Kirjallisuuskatsaus

Itämeri on yksi maailman vilkkaimmista merialueista ja liikennöivien laivojen määrä kasvaa jatkuvasti. Tästä johtuen terveydenhuollon ammattilaisia tarvitaan jatkuvasti lisää. Tämä opinnäytetyö on toteutettu EU:n OnBoard-Med projektille. Projekti halusi selvittää, kuinka paljon tietoa laivasairaanhoidosta on saatavilla. Opinnäytetyön tavoitteena on tarjota tietoa yleisellä tasolla terveydenhuollosta laivoilla. Opinnäyte on tehty kirjallisuuskatsauksena. Systemaattinen kirjallisuuskatsaus tehtiin neljästä tietokannasta; Cinahl, Ovid, PubMed ja Merilääketieteen tietokanta. Vähäisestä tiedon määrästä johtuen etsintää jatkettiin käsihaulla muista lähteistä. Opinnäytetyöstä muodostui yhdistelmä kriittisestä ja kartoittavasta kirjallisuuskatsauksesta.

Keskeisimmät aihealueet valittiin löydetyn tiedon luotettavuuden perusteella. Laivasairaanhoitaja ja työterveyshuolto olivat aiheita, jotka nousivat useasti esille. Kolmanneksi aiheeksi valittiin laiva-apteekki, koska se on olennainen osa terveydenhuoltoa merellä.

Tuloksista voi selkeästi päätellä, että pätevää tietoa ei ole tarpeeksi saatavilla. Suurin osa löydetystä tiedosta on epäolennaista tai vanhentunutta. Luotettavia ja laajempia tutkimuksia tulisi tehdä, jotta pätevää ja ajankohtaista tietoa olisi saatavilla. OnBoard-Medin toivoma tiedonhaku toteutettiin onnistuneesti ja tulokset annetaan projektin käyttöön.

### ASIASANAT:

Laivasairaanhoitaja, merenkulku, merellä, työterveyshuolto, laiva-apteekki.

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# 1 INTRODUCTION

The Baltic Sea is globally one of the most busiest sea areas. As many as 2000 large vessels such as oil tankers, tankers transporting hazardous material, cargo vessels and passenger ferries operate in the Baltic around-the-clock. In 2010 World Wide Fund for Nature (WWF) published a report about development prediction in the Baltic Sea. The prediction stated that by 2030 seafaring in the Baltic Sea would double and the size of the vessels would grow. (WWF 2016) Since the seafaring in Baltic Sea is growing coherently health care professionals are increasingly needed on vessels. On several vessels ship nurses are in charge of health care.

Our thesis is a part of EU project called *OnBoard-Med, Harmonization of on Board Medical Treatment, Occupational Safety and Emergency Skills in Baltic Sea Shipping*. We will be referring to this project by using the name OnBoard-Med. The overall objective of this project is in harmonizing and developing courses of skills in maritime emergency management, medical treatment and occupational safety. The main outputs will be three work packages about nursing, emergency care and maritime education. The courses will be built, pilot tested and improved cyclically during three years with target groups. The beneficiaries are maritime and nursing education institutions.

## 2 PURPOSE OF THE THESIS

This thesis aims to provide general information about the health care in seafaring. We find this topic interesting and commonly quite unaware. We have no previous information nor experience of this subject. Therefore our aim is to familiarize ourselves with the theme and introduce it to public. Thesis will be free for public use. We hope that this thesis will reach many readers and provide useful material for use.

According to the Government Decree of University of Applied Sciences, the aim of thesis is to develop and show the student's skill to adapt knowledge and expertise in professional practice (Valtioneuvoston asetus ammattikorkeakouluista 352/2003). Our condensed view will be on nurse's role onboard and on topics that are related to nurse's work on vessels. As registered nurse students we hope to widen our view of this profession through the writing process of the thesis. Getting familiar to this topic will give us prospect to our work as future health care professionals.

Together with another group of students we will on our part represent Turku University of Applied Sciences in an EU project called OnBoard-Med. The project is about harmonization of Onboard Medical Treatment, Occupational Safety and Emergency Skills in Baltic Sea Shipping. The main objective of the EU project is to improve seafaring by creating educational programmes that will be developed internationally. The beneficiaries of these programmes will be maritime and nursing education institutions around Baltic Sea. These institutions are Turku University of Applied Sciences, Höskolan på Åland, Eesti Merekoool, Latvian Maritime Academy and Riga Stradins University. (OnBoard-Med –brochure 2016) It is ideal to create discussion on the extent possibilities in nursing field. We find this project valuable and we are honored to assist in information research by forming an analysis table based on the data we find. OnBoard-Med will receive a copy of this analysis table.

### 3 IMPLEMENTATION OF THESIS

An act by Finland's Ministry of Justice (1129/2014) includes thesis to be part of the studies at University of Applied sciences (Valtioneuvoston asetus ammattikorkeakouluista 2014). Our thesis includes aspects from three literature review types: systematic review, critical review and mapping review. We started with a systematic research. It aims to find as many publications as possible which are relevant for the research topic (Jyväskylän Ammattikorkeakoulu). Critical review aims to find critical points and needs for new researches. Whereas mapping review aims to form a vision of existing research literature and to find what is lacking. (Axelin et al. 2015, 10)

#### Database search

Two groups of students worked together to form a preliminary research of articles from four databases. Our group focused on Cinahl and Merilääketieteen tietokanta. The other group focused on PubMed and Ovid. Our group was not able to find any information about Merilääketieteen tietokanta despite our search from online and libraries. We decided to outline it from the research.

The first search gave misleading results. We had not defined our key words strictly enough and the time period of articles was different between the groups. We chose a few main words and both groups searched information with differing combinations of these words and search criteria. Therefore, results between the groups were not comparable and we gained a lot of irrelevant information concerning army, animals etc. Because of the unwanted results we decided to do a new search.

This time both groups used the same search criteria and exact key words. Also, combinations with more than one word were specified to avoid inaccurate results. A table of results was made from each database. The search results were chosen based on the title and/or abstract. Search results were cross-checked within each group. A meeting was arranged to discuss results with the supervising teacher and the other student group.



After completing the preliminary search process both groups uploaded the findings into RefWorks. RefWorks is an online program that helps to create bibliographies and to form and edit references. (Refworks.com) RefWorks was used to remove duplicates and to form a combined list of the references. This list is called a preliminary search table (Table 1). Based on this list a reference analysis table was formed. This table includes author, publication year, the main point/point of view of article, targeted region, nurse's role, type of vessel, main conclusion and possible shipping company. This table was given to OnBoardMed for their use (Table 2).

Another meeting was held to finish the search process that OnBoardMed had requested from Turku University of Applied Sciences. From this point on both groups started working on their own separate theses.

### **Final product**

The writing process of the final product began by looking into other sources of information. Several libraries were visited in order to find relevant literature. In addition online sources were widely observed to find reliable researches and publications. Considerable amount of brainstorming and composing was done based on the findings. Once we began to have better understanding of the topic, first ideas about the final product were generated. At the same time irrelevant topics were cut out.

Preliminary topics for our final product were discussed. The final topics were chosen based on the amount of reliable and interesting information that was related to offshore health care. Ship nursing and occupational health care were themes that stood out the most. In addition, ship pharmacy was chosen as a third topic because of its relevancy. A plan of the implementation of the final product was created. The plan included different phases that were scheduled to a detailed timetable. This timetable was made to support the writing process to be finished on time. Close team work was done in order to form coherent text.

After completing writing the thesis the students must take part in a maturity test. (Valtioneuvoston asetus ammattikorkeakouluista 2014) The maturity test is done in both Bachelor and Master degree studies. The test measures the expertise in the chosen field of the thesis and high level of language proficiency. (Aalto University 2015)

## 4 FINDINGS

### 4.1 Characteristics of ship nursing

In order to work as a qualified ship nurse, one has to be a certificated Registered Nurse from an accredited nursing school. Usually, minimum two years of clinical work experience is required in health care. Employers have different policies and therefore variation is found in requirements. Work experience from emergency care with cardiac care, trauma and internal medicine is preferred. (Seamax International 2012)

Ship nurse must obey confidentiality obligation. Obligation applies to whoever is responsible for the nursing care. Information concerning an individual or a family must not be shared to third party. Written or legal permission is needed from the patient in case information needs to be shared. In most cases patient's oral permission is enough when information is shared within health care organizations. (Saarni H. & Niemi L. 2006, 178) Confidentiality obligation includes all information regardless of the way it is received and it continues even after contract of service has ended (Laki terveydenhuollon ammattihenkilöistä 559/1994).

### **Emergency actions**

Seafaring has a high risk for accidents because of the challenging working environment in vessels (Oldenburg et al.). Emergency first aid means first aid which aims to save the patient's life. First minutes are crucial and therefore emergency first aid has to begin immediately at the scene. Emergency first aid actions are to secure patient's respiration and circulation. Actions are the same in all situation no matter if it is an accident or a sudden attack of illness. Examples of emergency first aid include resuscitation, foreign object in airways, shock and suppressing a heavy bleeding. (Saarni H. & Niemi L. 2006, 8-9 & 14-16)

In Finland, seamen receive a basic medical training extent to 120-140 hours during their schooling. According to the STCW-95 general contract, everyone working on a vessel has to receive first-aid education. At the beginning of the career all crew members are required to go through a course called STCW Basic Safety Training. STCW is an abbreviation for International Convention on Standards of Training,

Certification and Watchkeeping for Seafarer's. The content of this course includes occupational safety and rescue skills in fire and emergency situations. All parts of the course must be successfully completed in order to work. In unsuccessful cases even health related reasons are not accepted. The emergency safety part has to be repeated every five years in order to keep skills updated. (Työterveyslaitos 2016, 4 & 13-14)

Practical implementation of evacuation is principally discussed and agreed together with the border guard or the personnel of harbor where the evacuation is planned. After evacuation ship crew can contact representative office at the evacuation location. They provide guidance and give further advise. Also Finnish Ministry of Foreign Affairs has a round-the-clock phone service for emergency situations. (Saarni H. & Niemi L. 2006, 155)

When transferring a patient from the vessel, nurses job is to prepare the patient by securing limbs and supporting neck. Type of transportation is chosen based on the patient's condition, type of injury and possible routes for transport. Patients oxygenation, circulation and body temperature have to be secured during transportation. Patient is primarily transported in lateral position. Precise report of current situation, previous actions and given care should be forwarded with the patient. Vessel crew is responsible for informing the patients next of kin unless the patient especially forbids it. (Saarni H. & Niemi L. 2006, 153-156)

### **Accidents in seafaring**

International data can be found only from very severe accidents, where the consequences include loss of human lives, severe harm for nature or total loss of the vessel (Trafi 2015, 4). The amount of fatal work related accidents has decreased remarkably (Oldenburg et al. 2010, 249). During 2014 there were 95 very severe seafaring accidents reported worldwide (Trafi 2015, 4). Inexperience, insufficient awareness of safety and unused personal protective devices are the main causes of fatal injuries related to work. Alcohol plays a big role in off-duty fatal injuries. Also weather adds on to the challenges of seafaring. (Oldenburg et al. 2010, 249)

H. L. Hansen, D. Nielsen and M. Frydenberg have done a research about the occupational accidents aboard merchant ships. The object of the research was to

investigate the frequency, circumstances and causes of occupational accidents aboard merchant ships in international trade. Also they wanted to identify risk factors for the occupational accidents as well as dangerous working situations where possible preventive actions could be done. Research was published in 2001. It stated that accident rates differ considerably between different ship types. It was also found that difference in behavior caused different accident rates among different cultures in the same workplace.

## **Consultation**

Consultation can never replace the readiness and clinical skills of the nurse. It is advisable to make a consultation in order to get a second opinion or to back up nurse's decisions and actions. Vessel's equipment and nurse's competence must be up-to-date. (Saarni & Niemi 2006, 175-177)

A successful consultation means that messages are worded and listened carefully as well as understood completely. All given information and acts should be documented in detail. A consult can't be successful unless the person asking for advice is able to describe the illness or accident to the physician. He or she also needs to understand and be able to implement the advices given by the physician. In some cases sending a photo can ease the discussion. Consultation can be problematic if the physician giving advice is not familiar with the working conditions nor the medicinal aids available on the vessel. It is important for the nurse to know exactly what is available and to be ready to inform the physician about it. Because of the poor confidentiality of the devices, mentioning personal identifiers such as name or social security number should be avoided. (Saarni & Niemi 2006, 175-177)

Vessels use an international system called Radio Medical which supports the health care on the vessel. Radio Medical is a communication service to help nurses consult a physician for example in a case of sudden illness or injury. These Radio Medical –calls are prioritized and go ahead of other calls made using radiowaves. (Viestintävirasto 2012, 51) Consultation of the physician working ashore can be done anywhere and anytime of the day. Radio Medical services are based on the international agreements and are free for use. (Saarni & Niemi 2006, 175-177)

Radio Medical calls are devolving in the Finnish sea area, because the system is gradually transferring into more modern telecommunication systems (Viestintävirasto 2012, 51) such as Telemedical Assistance Service, TMAS (Työterveyslaitos 2016). Since the connections have improved during the past years Finnish vessels are consulting more and more to other units. Vessels may contact TMAS which provides instructions or forwards the call to a designated emergency medicine physician on-call. (Finnish Maritime Administration 2009) Occupational health physicians, health care unit of their place of residence or other health care units can be consulted. (Saarni & Niemi 2006, 177)

#### 4.2 Occupational health

Occupational health care is an long-term action that is directed to employees and their place of work and working community (Kela 2012). It supports managing and maintaining the ability to work and prevents from disablement. Individual's occupational welfare is strongly connected to health and performance which have a further effect on safety onboard. (Tuomala 2010, 109 & 22) Finnish seafarers have the same fundamental rights to receive healthcare as citizens offshore (Saarni & Niemi 2006, 172). All employers in Finland are obligated to arrange preventive occupational health care (Sosiaali- ja Terveysministeriö 2016) and all employees are entitled to receive it (Työsuojelu 2015). Priorities include enhancing safe work environment as well as preventing and minimizing harmful circumstances (Kela 2012).

Basic principle is that employer covers employee's health care costs possibly outlining certain services for example dental care. The content and operation is planned in collaboration of the employer and the occupational health care services provider, so that it's in line with the workplace's needs. (Kela 2017) Services are arranged by the employer or bought from health care center, private clinic or other service provider. Services can also be distributed digitally, when the customer and the occupational health care professional are in different locations. (Sosiaali- ja Terveysministeriö 2016)

Employer is responsible to guide the employee to receive health care when believing that employee needs it. Employee cannot refuse from employers order to receive health care. (Saarni & Niemi 2006, 172) Maintaining and promoting employees working ability throughout one's career is an essential part of occupational health care. Tracking

is done by performing well implemented health examinations and check-ups (Työterveyslaitos 2016).

All seafarers must have health care services available in separate seafarers health care centers in which they are allowed to go to regardless of the place of domicile. These should also include dental care. (Terveysthuoltolaki 1326/2010) In Finland there are 13 seafarers' health care centers at the moment. These are located in Hamina, Helsinki, Kemi, Kotka, Lappeenranta, Maarianhamina, Oulu, Pietarsaari, Pori, Rauma, Savonlinna, Turku and Vaasa. (Valvira 2016) The Finnish Institute Of Occupational Health organizes qualifying and complementary training for the personnel of the seafarers' health care centers. (Työterveyslaitos 2016)

### **Characteristics of occupational health care onboard**

Due to growing seafaring traffic, reduced personnel and increased work load, personnel's hurry has increased. Continuous hurry is strictly related to fatigue and burnout in work and all these are examples of human risk factors in seafaring. Human factor is the largest singular risk in seafaring safety. Human factor is the hidden cause for the mistake, whereas the human error is the act causing it. For example if an employee is working continuously overtime. The employee becomes exhausted and makes a mistake because of it. Working overtime and becoming exhausted are the human factors and the mistake done is the human error. It is proven in many different researches that human factor and human error are the most typical reasons for seafaring accidents. According to statistics from 43% up to 93% of accidents are caused because of human factor or human error. (Tuomala 2010, 59-61)

Seafaring as a career was previously seen as full of freedom, independency and adventurous travelling of the world. Nowadays the image of the career is connected to education, demanding tasks and professional skills. This has changed the psychological point of view as well. The crew is in firm contact when staying on the vessel. Free time is spent in the ship together with only colleagues and communication with friends and family is minor even with today's developed electronics. The atmosphere and human relations can form a straining factor considering mental health. (Työterveyslaitos 2016)

Oldenburg et al. stated that the general challenges in seafaring are fatigue, isolation, multinational crews and limited opportunities for recreation. High demands and long working hours result in fatigue. Lack of good quality sleep can aggravate fatigue. Everyone requires unbroken periods of rest. Environmental factors such as noise, vibration and weather conditions may challenge sleep quality. Seafarers are among the most isolated working groups in the world. Efficient schedules restrict the crews' social contacts during their time in harbour. As the physical demands and health requirements are strict and the job market appears competitive many seafarers are unwilling to seek medical and psychological help. Crews consist not only of many different nationalities but also of members from different religious and cultural backgrounds. This reflects in different needs, values and expectations. (Oldenburg et al. 2010, 251-252) The incentives and free time activities available on the vessel are limited (Työterveyslaitos 2016).

Employer must take action according to work safety laws and regulations if an employee is harmfully exhausted because of the workload. Psycho-social straining can have an unwanted effect on mental health. (Tuomala 2010, 61)

#### 4.3 Ship pharmacy

There are laws and regulations that define the use of ship pharmacy in Finnish vessels. The purpose of the Ship Pharmacy law is to ensure best possible nursing care in illness or emergency situation (Työterveyslaitos 2016). The ship pharmacy contains a medicinal log, a first-aid kit, medicines, care utensils and necessary guides for the first-aid and health care given onboard. On top of the requirements the law also limits the content, for example types and amounts of medications. According to the law the content of ship pharmacy has to be kept behind locked doors. (Laki laiva-apteekista 584/2015).

The vessels have a limited selection of medications and medical equipment for use (Laki laiva-apteekista 584/2015). The minimum content of the ship pharmacy is determined by the vessels' operating area and the amount of crew. (Keränen & Meriläinen 2010, 9) If the size of the crew exceeds 25 people the amount of medical supplies has to be increased (Saarni & Niemi 2006, 174). Ship pharmacy is primarily for the crew to use but in situations requiring emergency care the content can be used for the care of the passengers (Laki laiva-apteekista 584/2015).

First-aid kit is stored in a clearly marked place that is only available for crew and can be reached fast. All medicine and care utensils need to be packaged and stored properly in order for them to be usable when needed. (Laki laiva-apteekista 584/2015)

### **Surveillance of ship pharmacy**

Medicinal log is essential part of observing medicine of the ship pharmacy. Medicinal log is written with the language used in the vessel and is completely separate from patient documentation. Unlike patient documentation medicinal log does not contain any patient identification, yet it is still confidential information. The medicinal log should be stored at least five years counted from the last documentation, for this reason extra carefulness in using and storing is important. The log includes large variety of information. All purchases made, medicines given and care procedures done must be written in it. Also removed medicines and care utensils are documented. (Laki laiva-apteekista 584/2015)

The vessels are divided into four groups depending on the distance from the nearest harbour that has the sufficient medical supply. The categories are A, B, C and D. (Sosiaali- ja Terveysministeriö 2015) In Finland ship pharmacies on vessel categories A, B and C are checked yearly by a legalized pharmacist. On category D vessels the inspection is done every three years. (Porvoon Uusi Apteekki) The chief of the vessel is responsible for updating, taking care and adding extra necessities in to the ship pharmacy. The practical responsibility is usually delegated to the chief officer or nurse. (Laki laiva-apteekista 584/2015) In case the vessel is not in Finland during the yearly check-up. After arriving to Finland the content of pharmacy is immediately checked by a pharmacist. The legalized pharmacist has the right to get information of the amount of medicine and care utensils that are needed in order to carry out the inspection. The inspections need to be documented to the medicinal log. An inspection document should be given once the legalized pharmacist has done the inspection acceptably. The language used in documentation is chosen based on where the vessel is operating. The document is to be stored in the ship pharmacy. (Laki laiva-apteekista 584/2015)

Finnish Transport Safety Agency, Trafi, inspects vessels in order to find what necessities are lacking. During 2014 the amount of inspections was 1531. Nearly a hundred of the given annotations concerned ship pharmacies. (Trafi 2015, 24) The



overall operation of the ship pharmacy is supervised by the Finnish Transport Safety Agency, the Occupational Safety and Health Authorities and health care supervising authorities. (Sosiaali- ja Terveysministeriö 2015)

## 5 DISCUSSION

The process of the thesis has been a new experience for all of us. Neither one of us has previously done a final report which is required in order to finish a degree. Before this process we were not familiar with the guidelines and rules. Searching instructions was the first learning experience in this process. Our thesis is a combination of three literature review types: systematic, critical and mapping. During the literature research we learned about different ways to find and represent information reliably. We got familiar with Refworks and databases called Cinahl, PubMed and Ovid. Further on we gained knowledge on health in seafaring.

Our thesis is part of the OnBoardMed –project which affected the process of the thesis. OnBoardMed needed the results of systematic research in short notice and this is why we could not follow the common timetable and order of work. We started our process with finding information through research process, contrary to the common way of starting with planning the thesis. Because the general order of a degree work was not previously familiar to us, working in uncommon order made the process even more challenging. This might have affected the quality of thesis.

In the beginning we did not know what kind of information we could find. Health in seafaring was a new subject for us. It is not well researched nor published subject which is why we were aware of the option of not finding much information. Because database research was unfamiliar for us, our first research results lacked in reliability. The key words were outlined unclearly with the other group and therefore our results were divergent. After the first round of research we found a lot of army related articles which were not related to our wanted topic. Also, some of the articles found were very old or contained information about animals and their health. At this point we narrowed down the key words. We met up and created new strict key words to gain reliability for the research phase we made again. With the re-search we found a bit more relevant articles yet we still decided to continue looking for more information manually.

Based on our findings ship nurses work is mainly occupational health care, emergencies, first-aid situations and small incidents. In contrast to nurses ashore who work in variety of different institutions such as hospital ward, elderly home or home care. Including patients of all ages in need of long term care, rehabilitation or palliative care. (Mol.fi 2004)

Care work, pharmacological treatment, guidance and supporting are essential parts of nurses work. Profession requires practical skills, interaction, precision, knowledge and capability to tolerate stress. (Mol.fi 2004) Same responsibilities concern ship nurses as the nurses ashore. However, nurses onboard seem to have limited resources and less helping hands which may complicate the work.

While getting familiar with the subject of ship nursing, we figured out that there are not many health care professionals working in seafaring. Information cannot be shared within other crew members because of the confidentiality obligation. This can be straining to the ship nurse because he/she is not able to share thoughts and concerns regarding patients with colleagues. The matter can be easily forgotten because it is natural in health care environments ashore.

All employers in Finland are obligated to arrange preventive occupational health care (Sosiaali- ja Terveysministeriö 2016) and all employees are entitled to receive it (Työsuojelu 2015). As the need for healthcare is stated in the law we think it is odd that we were not able to find recent data. Rules, regulations and supervision are increasing in today's society which in fact makes us think there would be data from past few years instead of from decades ago. We could continue searching articles and researches for our thesis but we think that by now we can already come to the conclusion that there is barely any useful information available. As long as there is no new information the conclusion will remain the same.

Many of the articles were not from current decade yet from the past five years. We wish more researches were done concerning ship nurses and their requisite work. Current information could be gained by visiting the ship nurses working environment. Nurses could be interviewed face to face or surveys could be produced. It would be interesting to hear opinions directly from ship nurses concerning their work and working environment. Specifically, what they feel is currently working well and what could be improved. Hearing their opinions about their schooling in comparison to the actual job could be beneficial in developing educational programmes. We don't think ship nursing should be taught as part of basic education but we think it would be interesting and helpful to have a course concerning the numerous possibilities of a Registered Nurse. This course could contain education and discussion of less common work places and career paths.

We were slightly disappointed to the amount of information found. We expected to find more relevant information to use. In the middle of the process we decided to end the research and to continue with the information we had. Luckily the few we found were reliable. As a group we have done our best with the resources found. Of course the findings could be more informative if there were more valid sources. However, speculation will not improve the findings nor the finished work.

We are pleased to notice how much we have learned throughout this process. We have further developed our social skills; communicating respectfully to each other, taking divergent opinions into consideration and discussing appropriately in situations we disagreed. As a group we are responsible to return this thesis to TUAS and OnBoard-Med. On top of that working in a group demands each group member to be responsible as an individual. We have been able to trust each other to take responsibility of individual work.

## 6 ETHICAL CONSIDERATION AND RELIABILITY

Ethics is a system of moral principles. What is good for individuals and society is widely defined by ethics. (BBC 2014) Writing the thesis includes rights and responsibilities, yet again our behavior and decision making is affected by ethics. Ethics won't give straight answers to questions (BBC 2014). We have made aware decisions from the beginning. Some things were left out but we have reflected what is valid and what is irrelevant for the subject.

Ethical guidelines apply to all acts that concern researches and development. The people writing the thesis are obligated to take ethics into consideration throughout the process. Reliability and research based on evidence are more valuable than any organization's benefit or expectations towards the thesis. (Kajaanin Ammattikorkeakoulu) This thesis was written by valuing reliability.

Turku University of Applied Sciences searched for students to participate in an OnBoard-Med project and we were immediately interested. Our topic was formed by their demands. Before beginning to write the thesis the information and benefit of the thesis must be examined. It is also important that the thesis is meaningful and worth of implementation. (Kajaanin Ammattikorkeakoulu) OnBoard-Med will receive the research table that we've done as part of our thesis. The beneficiaries of the OnBoard-Med project are in the maritime and in the nursing education institutions and that is the reason why we believe our work is useful and valuable.

No fraud methods were used when making this thesis. We have done our best in following the general ethical guidelines. Fraud and disregarding methods are ways of neglecting the ethical guidelines. Fraud includes observations and outcomes that were made up or illicitly cited, yet still presented in thesis. Disregarding appears e.g. as inadequate citing to previous research results or as misleading reporting of research results. (Kajaanin Ammattikorkeakoulu)

Source criticism is part of ethically written thesis along with suitability and reliability of the information (Kajaanin Ammattikorkeakoulu). We have carefully chosen our researches to enhance the quality and reliability of this thesis. Explaining and rationalizing exclusions during the process is required for working ethically (Kajaanin Ammattikorkeakoulu). We have hand-picked our references from trustworthy

researches, literature and websites. Our concern has been that the thesis would turn out misleading because of the lack of sources. Sometimes it has been difficult to find enough reliable information. We believe that if there was more information available the reliability of the thesis would increase. The text is written in our own words and we have not plagiarized anything from other publications.

There are things and agreements that are taken into consideration when viewing the work ethically (Kajaanin Ammattikorkeakoulu). A commission agreement was signed with Turku University of Applied Sciences before we began our writing process.

In research every participant's personal responsibility is emphasized. The students' general ethics appear already in how they are able to follow the agreed schedules, content and objectives. (Kajaanin Ammattikorkeakoulu) We have all done our best in finishing the thesis. Each member of our group has equally contributed. Most of the writing has been done together to advance the reliability and quality of the thesis.

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## APPENDIX

### Appendix 1. Preliminary search table

Criteria used in systematic search were:

- articles with abstract
- English only
- humans
- title/abstract

Date	Database	Keywords	Results
30.11.2016	Ovid	Ship nurse	2
1.12.2016	Pubmed		1
2.12.2016	Cinahl		9
30.11.2016	Ovid	Ship AND nurse	38
1.12.2016	Pubmed		20
2.12.2016	Cinahl		28
30.11.2016	Ovid	Ship nurse AND education	0
1.12.2016	Pubmed		0
2.12.2016	Cinahl		2
30.11.2016	Ovid	Ship AND nurse AND education	8
1.12.2016	Pubmed		1
2.12.2016	Cinahl		8
30.11.2016	Ovid	Nurse AND cruise	15
1.12.2016	Pubmed		8
2.12.2016	Cinahl		2
30.11.2016	Ovid	Healthcare AND cruise	5
1.12.2016	Pubmed		2
2.12.2016	Cinahl		2
30.11.2016	Ovid	Nurse AND ship AND personnel	5
1.12.2016	Pubmed		3
2.12.2016	Cinahl		1
30.11.2016	Ovid	Nurse AND ship NOT military	35

1.12.2016	Pubmed		20
2.12.2016	Cinahl		23
30.11.2016	Ovid	Ship nurse AND training	0
1.12.2016	Pubmed		0
2.12.2016	Cinahl		1
30.11.2016	Ovid	Ship AND nurse AND training	3
1.12.2016	Pubmed		3
2.12.2016	Cinahl		5
30.11.2016	Ovid	Nurse AND sea AND training	4
1.12.2016	Pubmed		3
2.12.2016	Cinahl		3
30.11.2016	Ovid	Nurse AND sea AND competence	0
1.12.2016	Pubmed		0
2.12.2016	Cinahl		1
30.11.2016	Ovid	Ship nurse AND competence	0
1.12.2016	Pubmed		0
2.12.2016	Cinahl		0
30.11.2016	Ovid	Ship AND nurse AND competence	0
1.12.2016	Pubmed		0
2.12.2016	Cinahl		0
30.11.2016	Ovid	Nurse AND offshore	3
1.12.2016	Pubmed		3
2.12.2016	Cinahl		4
30.11.2016	Ovid	Health personnel AND ship	0
1.12.2016	Pubmed		0
2.12.2016	Cinahl		4
30.11.2016	Ovid	Health AND personnel AND ship NOT military	20
1.12.2016	Pubmed		20
2.12.2016	Cinahl		7
30.11.2016	Ovid	Nurse AND sea AND education	7
1.12.2016	Pubmed		7
2.12.2016	Cinahl		3
30.11.2016	Ovid	Medical personnel education AND sea	0
1.12.2016	Pubmed		0

2.12.2016	Cinahl		0
30.11.2016	Ovid	Medical personnel AND sea	8
1.12.2016	Pubmed		10
2.12.2016	Cinahl		3
30.11.2016	Ovid	Emergency AND nurse AND sea	8
1.12.2016	Pubmed		5
2.12.2016	Cinahl		2
30.11.2016	Ovid	Emergency AND nurse AND ship	3
1.12.2016	Pubmed		0
2.12.2016	Cinahl		0
30.11.2016	Ovid	Nurse AND competence AND navy	2
1.12.2016	Pubmed		2
2.12.2016	Cinahl		2
30.11.2016	Ovid	Maritime nurse	0
1.12.2016	Pubmed		10
2.12.2016	Cinahl		0
30.11.2016	Ovid	Maritime AND nurse	6
1.12.2016	Pubmed		5
2.12.2016	Cinahl		2
30.11.2016	Ovid	Emergency care AND sea AND nurse	3
1.12.2016	Pubmed		1
2.12.2016	Cinahl		1
30.11.2016	Ovid	Emergency AND care AND sea	36
1.12.2016	Pubmed		38
2.12.2016	Cinahl		3
30.11.2016	Ovid	Emergency AND care AND sea AND competence	0
1.12.2016	Pubmed		0
2.12.2016	Cinahl		0
30.11.2016	Ovid	Emergency AND care AND sea AND education	6
1.12.2016	Pubmed		4
2.12.2016	Cinahl		0
30.11.2016	Ovid	Emergency care AND sea AND training	2

1.12.2016	Pubmed		1
2.12.2016	Cinahl		0
30.11.2016	Ovid	Navy nurse competence	0
1.12.2016	Pubmed		0
2.12.2016	Cinahl		1
30.11.2016	Ovid	Navy AND nurse AND competence	2
1.12.2016	Pubmed		1
2.12.2016	Cinahl		2
30.11.2016	Ovid	Nurse AND sea	46
1.12.2016	Pubmed		27
2.12.2016	Cinahl		20
30.11.2016	Ovid	Navy nurse	25
1.12.2016	Pubmed		14
2.12.2016	Cinahl		26
30.11.2016	Ovid	Offshore nurse ship	0
1.12.2016	Pubmed		1
2.12.2016	Cinahl		0
30.11.2016	Ovid	Offshore AND nurse AND ship	0
1.12.2016	Pubmed		0
2.12.2016	Cinahl		0
30.11.2016	Ovid	Offshore nurse	1
1.12.2016	Pubmed		1
2.12.2016	Cinahl		4